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THE RELATION OF LEXICON AND GRAMMAR.

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THIS PAPER DISCUSSED THE NEED TO INCREASE THE SCOPE OF PRESENT DICTIONARIES TO PROVIDE A COMPLETE LANGUAGE DESCRIPTION WHICH WOULD INCLUDE A GRAMMATICAL STATEMENT AND A CONTENT DESCRIPTION AS WELL AS INFORMATION PRESENTLY PROVIDED. THE INVESTIGATOR FELT (1) THAT DICTIONARIES AND GRAMMATICAL STATEMENTS CAN PROFITABLY BE DESIGNED AS PART OF A UNIFIED PROGRAM OF LANGUAGE DESCRIPTION AND (2) THAT DICTIONARIES SHOULD DIRECT PARTICULAR ATTENTION TO CLASS CLEAVAGE, AND IMPORTANT FACTOR IN UNDERSTANDING THE GRAMMATICAL STRUCTURE OF A LANGUAGE WHICH CAN SELDOM BE ADEQUATELY TREATED IN A GRAMMATICAL STATEMENT. THE REPORT IS ONE OF A SERIES OF 13 PAPERS PRESENTED AT A CONFERENCE ON LEXICOGRAPHY, INDIANA UNIVERSITY, NOVEMBER 11-12, 1960. (GD)

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THE RELATION OF LEXICON AND GRAMMAR

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1. Scope of the Paper In this paper I am charged with discussing the relation between lexicon and grammar. This might be interpreted as meaning either of two similar, but not identical problems: the relation of grammar (a portion of language structure) with lexicon (another portion of the total language structure), or the relation of a grammatical statement with a dictionary (both documents of some sort). In the former case the question is one of language theory; in the latter, one of practical descriptive technique. I shall not choose between these, but rather say something about each. However, I believe that it is important to keep the two clearly distinct. This I will try to do by being careful with the terminology, even if this forces me to a somehwat awkward phraseology. I shall use the terms as I just have: "grammar" and "lexicon" will be sectors of language structure, "grammatical statement" and "dictionary" will be descriptive instruments or products of linguistic research. This is, of course, a restriction of the use of both "grammar" and "lexicon", since these are commonly used of the linguist's output as well as of his subject matter. I shall try to make the distinction because I feel that the terminological confusion here has been at the root of some of our difficulties in thinking on these matters.

2. Attitudes toward Grammar and Lexicon For the American descriptive linguist there is a very sharp contrast in attitudes toward the two members of either of the relationships. Grammar and grammatical statements are for him, respectively, a central portion of his subject matter and his basic product. If he gives much thought to theoretical matters — and many linguists do, of course — a goat deal of that thought is devoted to the nature and internal structure of grammar. Much of his practical work is that of producing grammatical statements or portions thereof, of investigating techniques for finding or organizing such statements, or in appraising and perhaps restating the grammatical statements of others. He is always interested in new fragments of theory, new twists in organization, a new device for analysis, a new notation.

Not so, however, with either lexicon or dictionaries. Very little thought is given to lexicon, and few have any clear idea what they mean when they say the word. Commonly it is treated as essentially equivalent to vocabulary, perhaps only a slightly more elegant synonym. Certainly we descriptive linguists tend to be contemptuous of vocabulary. It is almost a dogma among us that vocabulary is the least significant part of language (save for a group among us who even doubt that vocabulary is really a part of language after all.) Clearly this is, in part at least, a reaction to the equally naive popular tendency to identify language and vocabulary. But we can hardly excuse ourselves from so thoroughly degrading vocabulary by the fact that it has been by others so unduly exalted.

3. The Bloomfield tradition There is certainly more that figures in this attitude than just the reaction to popular pseudo-linguistics. We stand in the Bloomfield tradition, and our thinking is rooted rather deeply in his Language whether we get it direct or second-hand. In the first place, Bloomfield also was infected by the confusion of lexicon and dictionary. He gives at least two definitions of lexicon: "The total stock of morphemes in a language is its lexicon." (p. 162) "The lexicon [dictionary] is really an appendix of the grammar, a list of basic irregularities." (p. 274) But Bloomfield (in contrast with some other linguists) does not seem to use "lexicon" and "grammar" as easy transitions to carry his argument from language to description and back again; he had too strictly logical a habit of thinking and writing for that.

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Apart from the failure to distinguish language and description, these two definitions are not in conflict. Of the two, it is the second that reveals the more. Bloomfield is defining lexicon in terms of "basic irregularities". He goes on to point out that both meaning and class membership are irregularities, and so assigned to the lexicon.

Nothing might be better calculated to divert the interest of the typical American descriptive linguist from the lexicon. He is primarily — often almost solely — interested in the regularities. Indeed "irregular" is almost a tabooed word for many of us. We dislike such statements as that man has an irregular plural, euphemistically preferring to rephrase it in terms of a "small class". We have also an underlying dislike for the irregularity itself, and we spend a great deal of our time seeking a statement that will reduce the number of irregularities (or small classes) by finding common features (regularities) which run through them. Sometimes we resort to some rather remarkable gymnastics to bring such irregularities in line, e.g. the "replacive" which quite artificially makes an affix out of a process. Or we look for excuses to shove these irregularities outside our jurisdiction — is not linguistics basically the study of the regularities in language behavior? To a very real extent, we have made the dictionary exactly what Bloomfield suggests — a list of irregularities, the refuse of grammatical description, the repository of things put aside because they did not give a clear and incisive picture of an all-pervading "structure" (for some of us, nothing more than a fancy synonym for "regularity") which the descriptive linguist finds esthetically pleasing.

4. Current neglect of lexicon and dictionaries We don't talk much about either lexicon or dictionaries. My own Introduction to Descriptive Linguistics will serve as an example. Neither word appears in the index, though on page 347 I have a little statement of what might be considered as a minimally adequate description of a language including "a summary of the phonology and morphology; a vocabulary of, say, several thousand words; ..." Lower on the same page I say "incredibly few languages have, for example, an adequate dictionary, that is, one in which the vocabulary entries run to tens of thousands and in which the definitions are not merely one word translations, but include citations of usages and discussion of the range of meanings. Many more such dictionaries are needed." That's pretty sparse treatment!

Hockett's A Course in Modern Linguistics does little better. He has two entries under "dictionaries" in his index. They lead to the following statements. "Bilingual dictionaries and easy word-by-word translations are inevitably misleading; the shortcut of asking what a form means must ultimately be supplemented by active participation in the life of the community that speaks the language." (p. 141) "In theory, and largely in practice, idioms are the stuff of which dictionaries are made. The reason is obvious: a dictionary-maker need not include a non-idiomatic nonce-form, since a speaker of the language would never look up such a form. He would look up the component parts, if he needed to, and automatically know the meaning of the whole. In practice, of course, no dictionary is ever complete. There are far too many idioms in any language, and more come into existence every day." (p. 173) Not really a very good showing either! And in some other good or widely used books in general linguistics, I could find nothing at all.

Nor, do descriptive linguists do much with the production of dictionaries. In at least one of the recent conferences on language materials for the NDEA there was a definite and completely general reluctance to undertake dictionary preparation. This was in sharp contrast to the almost universal eagerness to take on certain other tasks. Dictionary making is tedious in the extreme. It is exacting. It is an incredibly large job. As now practiced its operations are quite different from those in which the descriptive linguist feels thoroughly at home.

Descriptive linguists have been immensely critical of dictionaries and dictionary-makers. Commonly the principles on which they have based their criticism have been of very little relevance to dictionaries. It seems to me that we commonly make quite unreasonable demands and show little if any understanding of the limitations within which a dictionary maker must operate. And I think it is on the whole fair to say that some of the most vociferous critics have been those with the least actual experience in dictionary making.

Not only so, but I think it can be shown that relatively few of the dictionaries produced by American descriptive linguists have actually conformed to the standards that we have talked of. The dictionaries with good and copious citations of usages and a conscientious effort to explore areas of meaning have been mostly produced by people outside the fraternity — non-American linguists, non-descriptive linguists, or people laying no claim at all to the title of linguist. Those American descriptive linguists who have produced dictionaries are often known for their other work much more than for the lexical contributions.

2. The total descriptive task Bloomfield says (p.138) "The description of a language, then, begins with phonology, ... When the phonology of a language has been established, there remains the task of telling what meanings are attached to the several phonetic forms. This phase of the description is semantics. It is ordinarily divided into two parts, grammar and lexicon." Apart from the use of "meaning" and "semantics" in ways that are not now current, I consider that this is an important emphasis in Bloomfield that has, unfortunately, not been strongly maintained. It would mean, I believe, that an adequate description at our present state of development would necessarily include not only a grammatical statement, but also a dictionary. But it is clear that not many descriptive linguists have felt any strong sense of responsibility beyond the production of the grammatical statement.

There must of course be some outer bound to the responsibility of a linguist to a language — he is not called on to describe the total speech behavior of a person or a community. It can be debated where this bound should be set. It seems to me that the most logical bound would be such as to include within the linguist's domain at least a considerable part of the material ordinarily relegated to the dictionary. I consider that there are two compelling reasons why this should be so.

First, it seems well nigh impossible to carry on a reasonable grammatical analysis without at the same time building some sort of a lexical file. Nor is it possible to do anything particularly useful with a grammatical statement in the absense of any lexical information. Both these would suggest that the grammatical statement and the dictionary are interdependent in some important way.

Second, I feel that it will only be by wrestling seriously with the problem of compiling a dictionary that we can overcome our habit of excluding from the grammatical statement certain inconvenient details on what is really no other ground than merely that they are inconvenient. Whether we like it or not, every grammatical statement implies some delimitation of scope as betweeen itself and the dictionary. But we have examined and defined that limit from one side only. There ought to be positive reasons for assigning a feature to the dictionary rather than simply negative reasons for banishing it from the grammatical statement. Or putting it another way, the best way to cure ourselves of sweeping things under the rug is to accept the responsibility for cleaning the whole floor.

We may follow Bloomfield in considering the descriptive task as divided between the grammatical statement and the dictionary. (And of course the

phonological statement, but we will not mention this explicitly every time.) On what basis is this division to be made? This is not a matter which is commonly defined or even discussed. The current practice is largely a result of slowly accreting tradition. There is little reason to expect that it can be precisely formulated, or even that the division is very effective. There is overlapping of function, and probably parts of the task that are left in no-mans-land. Our notions of what a grammatical statement should do have grown up without much reference to the functions of dictionaries, and conversely. Nevertheless, there are several possible bases that have been suggested, assumed, or merely accepted in default of any formulation of principles. All of them have important points of contact with Bloomfield's definition of lexicon in terms of "basic irregularities".

6. Form versus meaning One very common implication is that the grammatical statement deals with form, the dictionary with meaning. This is seldom if ever advanced as a definition, since, as soon as it is, its difficulties become clear. Yet it does seem to have had some influence in determining practice. Traditionally, the dictionary is a list of words (here meaning, properly, paradigms as exemplified by some single form or selection of forms). As such it can handle only those meanings which inhere in words. Meanings of constructional patterns, inflectional affixes, and often also derivational morphemes are necessarily entered, if at all, in the grammatical statement. For some grammarians the giving of such meanings is an important function of the grammatical statement itself, perhaps even its main function. For others, including most American descriptivists, the meanings in a grammatical statement are quite incidental, and from a rigorous point of view out of place. To prevent the grammatical statement resting in anyway on meanings, they are so inserted as to make them totally independent of the structure of the statement, so that they might be expunged from it without destroying the integrity of the whole. Perhaps it is this reluctance to view meanings as any other than improper intruders in a grammatical statement that has led many descriptive linguists to minimize this by removing much of it to the dictionary. They tend to make the dictionary not so much a list of words as of morphemes. However, even when inflectional morphemes are all listed in the dictionary and their meanings given there, it is in general still necessary to refer to the grammatical statement to get the maximum amount of information on their meaning. This is simply because it is only in the grammatical statement that the contrasts, collocations, and other pertinent elements of the meanings of inflectional morphemes are ordinarily given. Their meaning inheres, in part, in their place within a system and cannot easily be made clear when they are treated outside that system.

Conversely, of course, the dictionary always carries a considerable mass of formal information, even if this is nothing more than the assignment of words to "parts of speech". But ordinarily this is not all. Hidden away in our advocacy of copious citations of usages may indeed be a demand for additional formal information — in this case largely the collocational possibilities of the forms. With function words, of course, the dictionary definitions, generally thought of as statements about meaning are actually largely statements about use, as may be seen in any good English dictionary in the articles for the, not, etc.

7. Tight structure versus loose structure Linguistic structure is normally considered by linguists as quite tight and hence properly amenable to the yes-or-no type of description which is traditional in descriptive linguistics. However, occasionally sets of language phenomena observed which, though apparently structured, seem not to be so rigorously structured as this. There seems to be a feeling that such items are more appropriately assigned to the

dictionary than to the grammatical statement. However, such a formulation raises more questions than it answers. In the first place, many might raise doubts as to the validity of the conception on which it is based. Past experience has shown that many of these loosely structured subsystems are such simply because they have not yet been properly analysed. Every field linguist has had the experience of finding such a bundle of refractory material which later t rns out to be as regular and systematic as any other part of its structure. It would be most unfortunate if the distinction between the grammatical statement and the dictionary were to rest so directly on our analytic shortcomings.

If the grammar of a language consists of a tightly integrated core surrounded by a penumbra of less tightly structured material gradually fading out into nothing, then grammar itself becomes an undelimitable concept. There must either be some reasonably clear bounds to grammar, or if there should be any such loosely integrated structures, there must be some further principle of internal organization of grammar which gives some real basis for cohesion. This is most probably provided by the idea of degrees of grammaticalness. It may then be that part of what is meant by this criterion of tight structure versus loose structure is merely that the grammar should attempt to cover only down to some definable degree of grammaticalness, leaving tag ends beyond to the dictionary. If this is what is meant by the suggestion, then it deserves a restatement in these terms.

There are other possibilities of interpreting what is meant by loose structure as against tight structure. In some cases no kind of analysis or reanalysis can force the material into the sort of model that descriptive linguistics find appropriate to grammatical statements. In such an instance the issue may not be the degree of structuring so much as the kind. It would be most strange if only one kind of structuring should actually apply to any set of patterns as complex as speech behaviour. No linguist can defend the proposition that his discipline can properly handle all that is worth description in speech. Crossing grammatical structure in various ways are certainly other types of structurings, some of them, at least, so different in form as to be unrecognizable as structure by the methods of descriptive linguistics. Others are parallel enough that the linguist inevitiably finds part of the patterning in the course of seeking out the grammar. Some of these loosely structured systems (from this grammar-oriented point of view) may be merely the imperfect projection onto a grammatical plane of structures which are more appropriately studied on some other plane by some other method.

That which would be most likely to obtrude on the attention of a linguist doing grammatical analysis would be any system of structure which had numerous contacts with grammar, and which so paralleled grammar in structure that very similar methods of analysis might appropriately be applied. I believe that there is such, and that its contacts with and general structural similarities to grammar are so strong that it belongs within linguistics rather than just outside linguistics. It is this that I mean by content.

8. Widespread versus isolated Another possible basis for defining the scope of grammatical statement and dictionary is in the breadth of relevance of patterns. All matters that apply to a considerable number of items would belong to the grammatical statement; those which apply to a single item to the dictionary. Thus the fact that a considerable number of English words occur in pairs, one singular and one plural, justifies inclusion of this phenomenon in the grammatical statement. The fact that the plural formation in men is isolated would suggest that it should be treated in the dictionary.

While such a discrimination may be broadly workable, it is not easily applied in some cases. At a low level of grammaticalness it presents little trouble. Groups of items may be sorted out and assigned labels, among them determiners and nouns, and each of these groups has several members. But a grammatical statement at this level of grammaticalness has rather little value. If, however, the statement is based on a much deeper level of grammaticalness, the situation is much different. Most of the small closed classes (like determiner) must be considerably subdivided. The result is that there are now a considerable number of unique items. But it will not do merely to exile these to the dictionary. Consider a single example: Among the nouns is a considerable subclass including, United States, Thames, Battery (New York), Hague (city), Hartford (an insurance company). These are all alike in that they are always preceded by the except in noun-adjunct position. At this level, the is isolated, among other things by the fact of this special relationship to the subclass of nouns just mentioned. We have here a grammatical fact that connects a class of items with an isolated item. Is the rule to be assigned to the grammatical statement on the basis that it applies to a plurality of items, or to the dictionary on the basis that it applies to a single item?

If this criterion were to be followed quite literally, I believe that it would destroy any useful conception of grammar and render grammatical statements largely worthless. It would have the peculiar property of assigning a larger proportion of the material to the dictionary at every successive degree of grammaticalness, perhaps even to the extent that the total bulk would shrink as it gets more detailed. Certainly it would have the effect of destroying the cohesiveness which we normally take to justify a grammatical statement. Indeed if we speak not of words, but of morphemes, the structure is shipwrecked to begin with, since most of our English inflectional morphemes are unique on even the grossest level.

9. Class versus member. There is an obvious way around the difficulty of the last proposal. An item like the must be in the grammatical statement, isolated or not. The best way to accomplish this is to set up a class or subclass to include it, with no concern as to whether there are other items to be included with it. At the first sight, it would seem that we are accepting two different criteria for classes. One is based on groups of items sharing a significant distribution and justifies classes such as that mentioned above including United States etc. The other causes us to set up single member classes for every instance where exclusion from the grammatical statement will render the latter fatuous (e.g. by reason of excluding from the grammatical statement the only relationship which makes it worthwhile to define the sub-class of nouns including United States.) Actually it is much better to bypass any such definitions and merely consider that the classes are set up in the process of analysis simply because they seem to be needed in the analysis; they are not found in the corpus, but created as the analysis is created.

The grammatical statement then takes care of all relationships between classes. It says nothing at all about words, morphemes, or any other items, only about classes which bear a very special kind of relationship with the items. We ordinarily call the latter "members" of the classes, but we must be clear that this means nothing like being part of the classes. The class is given a very different status than was suggested in the last section. But a discussion of this point would take us too far into grammatical theory for the present context.

The dictionary will be left with the responsibility for those matters which pertain to the members of classes. Among other things, this would leave the dictionary to identify the class (and subclasses) to which an item is related.

10. Functions of a dictionary This proposal does not, of course, answer the questions. What is the function of a dictionary under this plan? There are several possibilities, probably more than one of these functions could be discharged in combination.

1. The dictionary might be an index to the grammar. Thus for each item it would state to what class and sub-class it is related. Class-cleavage, in some languages an extremely important phenomenon, would be shown in the dictionary by the mention of two classes at one entry.

2. The dictionary might serve as amendment to the grammar. Assume that there are two or more forms whose distribution is not absolutely parallel on a grammatical plane. These might nevertheless be assigned to the same class or subclass. If this were done, the grammatical statement would either state the common distribution of the two or their total distribution, or some compromise. Then the dictionary might correct the statement by making clear the departures of each from the idealized distribution ascribed to the class. We descriptive linguists don't like to contemplate the notion that our grammatical statements may not actually fit the structure of the language precisely. Perhaps we are right in this; either they fit absolutely, or we have not formulated them correctly. But perhaps we are merely presumptuous in assuming this sort of a fit between statement and grammar. It may be that language description is a bit like chain and compass traverse. The surveyor fits a sequence of straight lines and measured angles to a winding road. A skillful surveyor comes out with a pretty fair approximation. But he also brings back a set of field notes which state the places and extent of departures from his traverse. The draftsman takes both to construct the map. Is a grammatical statement analogous to the rectilinear traverse, the dictionary to the field notes, and both therefore necessary to give a true picture of the sometimes imprecise meanderings of language?

Perhaps that this is true has been pretty well hidden from us by a variety of things. Among the more important, that we have tended to concentrate on structural sketches dealing only with reasonably high levels of grammaticalness. I would venture the guess that as we reach deeper into a language structure the precision of language structure blurs. If this is so, the ultimate limit of grammar in this direction is at the place where our traditional yes-or-no grammatical statements cease to be useful descriptively, i.e. at that place where the basic statement is so poorly fit to the structure that the amendments and reservations which must be registered in the dictionary overwhelm it and make it useless. Or otherwise, the place where it is better to merely describe ad hoc rather than attempt to formalize and systematize.

3. Not so different from the final outcome of the last suggestion is the suggestion that the dictionary might be assigned the task of carrying the description beyond the bound in grammaticalness set for the grammar. That is, the grammatical statement might be required to state the structure down to level n, but the dictionary to give, so far as it can be given, the structures at levels n + 1 ... This limitation might be imposed by incompleteness of the analysis (There is no real object in presenting another level of grammaticalness in the grammatical statement if it has not been sufficiently well worked out that its cohesiveness is demonstrable.), by convenience (For some purposes a very highly explicit grammatical statement may be inconvenient to use, ... particularly at the deeper levels of grammaticalness.), or by the fact that we have approached the limit of grammar.

4. The dictionary might serve as a system of cross-reference and correlation of entries within the grammatical statement. Highly explicit types of grammatical statements — and the trend of development is in this direction —

are quite rigidly ordered by their own requirements of explicitness and simplicity. It may be that there are reasons to bring together statements which are widely separated in the grammatical statement. When, as often, these involve small classes or subclasses, the dictionary might well serve this function. It would in effect assemble the various rules bearing on a particular vocabulary item, and thus circumvent, for certain purposes, the rigor of the statement itself.

5. The dictionary might serve as a device to correlate the several structural systems, grammar being one of them, which bear on the usage of individual items. It would do this by indexing the several systematic statements in which these structural systems are described.

6. The dictionary would define referential meaning.

11. Grammar and Lexicon None of these suggestions for the division of the descriptive task between the grammatical statement and the dictionary seem to provide any very adequate basis for a parallel distinction between grammar and lexicon. That is, none seem to correlate in any very satisfying way with a possible view of language structure that would seem theoretically adequate. The great problem is that most seem to point very strongly toward viewing grammar as an integrated system, and lexicon as a miscelaneous remainder. If lexicon can be given no better basis than this, it is clearly not to be considered as a basic segment of language structure in the way that the grammar and the phonology are to be considered. In short, rather than ask what is the relation between grammar and lexicon, it may be more meaningful to ask whether lexicon is properly to be considered as a portion of language structure at all. The answer to this question is certainly no if lexicon is not in some way structured, and indeed structured in some characteristic way.

Now, there is certainly some structure in the material generally excluded from the grammatical statement and thus relegated to the dictionary. The literature has frequently noted the structural nature of certain segments of "meaning", particularly within the system of basic color terms. In any one language, however, systems of this sort are not generally considered to be numerous or, within the framework of the total vocabulary, important. The structuring of color terms is commonly considered exceptional. But, of course, it may well be that this is because we have not yet developed adequate methods of finding thosestructures which actually exist. Perhaps the structuring of the color vocabulary is atypical only in that it is so obtrusive as to require no very sophisticated techniques for its discovery. And again, it may be, like the phonology and grammar, that the structuring is very much more apparent against a background of the total system than it will be if individual segments are viewed separately. Perhaps what we have blythely called lexicon is after all a residuum of unanalyzed material out of which there remain to be sorted a system, or even a number of systems of diverse types. This latter I would consider the most likely situation.

If so, my difficulty in finding much concrete to say about the relation of grammar to lexicon is precisely because of the non-homogeneous nature of what we have been treating as lexicon. The question must remain cloudy until we are able to delimit one or more of these systems. What is required at this stage is not so much a discussion of the relation of grammar and lexicon, as an effort to bring some order into the chaos we have been calling lexicon.

12. The content system The most accessible (at least to linguists) of the possible systems confused within the lexicon is the content (as I have used the term in the Introduction to Descriptive Linguistics. This is certainly not identical with Hjelmslev's use, or any of the common understandings of his use, and was not intended to be. It may indeed be radically different, in which

case I ought not to have even considered the term "content" for it. But what suitable alternative is there? Perhaps it might be referred to as "semantic structure". But I dislike the term, since "semantic" and its congeners have been almost completely emptied of meaning by extremely loose and often contradictory usages.)

By content here I mean a systematic structure which relates items (some kind of -emes; again no satisfactory term is at hand, though "sememe" has been used.) in a variety of ways. The structure as a whole is related at many points with the grammar, but it is not isomorphic. The relationships which are pertinent are a different set of relationships and sometimes cut across those which are grammatically pertinent. They must be analyzed by a different set of comparisons, and the results must be analyzed in a different way. But it seems to me that the differences in analytic method and structure of the resulting statement are not more different from those of grammatical analysis than are those of phonological analysis. That is to say, content stands with phonology and morphology in contrast with certain other much more different structurings which apply to speech behavior and are perhaps better considered as outside linguistics proper.

The content structure seems to involve at least three types of interrelations. And it is these three with which content analysis must operate. These are the following.

1. Paradigmatic relationships between contrasting entities. The type case here is the familiar description of the primary color term system. The basic color terms of English are a closed class of eleven terms. Typically they are all designated by adjectives, but the primary color terms are not a grammatically definable sub-class of adjectives, at least not at any fairly reasonable depth of grammaticalness. Not only do the basic colors contrast with one another; they contrast in a quite definite way. The whole set is ordered into a network — *green* contrasts in a special way with *blue* and *yellow* which is quite different from the way in which it contrasts with *purple*. Grammatically there is no discernable difference between the contrasts *green* : *blue* and *green* : *purple*.

2. There are many other color terms in English. They all relate to this basic system, but through a different type of structure. Among the others are such terms as *vermilion*, *scarlet*, *emerald*, and *cyanic*. The first three can be substituted for by *red*, *red*, and *green*, respectively, in a very large number of contexts with minimum alteration of semantic appropriateness of the sentences. But all other substitutions have a quite different effect. These substitution relationships order these terms into a kind of hierarchy, making each of the larger set dependent in some definable way on one member of the basic colors. *Vermilion* and *scarlet*, both subsumed under *red*, contrast directly with each other; their contrast with *emerald* is in some way tied up with the contrast of *red* and *green*. *Cyanic* stands in a third level in the hierarchy; this type of substitution relations exist with *blue*, *purple*, and *red*. Moreover, it contrasts only with one term *xanthic*.

3. The third kind of content structure is that of collocations. *Cyanic* and *xanthic* are shown to be very specialized by the fact that they occur only in contexts dealing with flowers. The others are mostly more general. The basic color terms are most general, much the commonest, and incidentally the best defined. Some of the lower level of the hierarchy are quite specialized. *Buff* occurs most commonly in contexts with *paper*, *card*, and similar items, and *goldenrod* (an adjectival) only in such contexts.

We noted that the basic color terms could not be defined as a class grammatically. That is there are no grammatical properties which they do not

share with other adjectives which from the point of view of content structure are unrelated. However, that content structure and grammatical structure are closely interrelated is shown by the fact that within the total class of color terms, the three levels in the hierarchy are grammatically distinct. The eleven basic color terms all occur with the suffixes -er and -est. The secondary color terms seem to include none which are so used, though all can occur with more and most. (Color terms are often homonymous with nouns, but they are never nouns in noun-adjunct position.) Finally cyanic and xanthic do not seem to occur in either construction, though that they are adjectival is demonstrable from their behavior in certain transformations.

The set of color terms is of particular value also in that it shows quite clearly another special characteristic of content structure. It consists in the grouping of non-linguistic variations on the basis of a linguistically controlled system. It is thus comparable with the phonology which groups aucoustic phenomena into linguistically significant units. The color system apportions all possible physical stimuli in its domain among its members in a way that is essentially exhaustive and mutually exclusive. It gives, therefore, a systematic basis within which to describe the referential meaning ranges of the items concerned. The same is true, with interesting variations, in a number of other content sub-systems which similarly apportion "reality". Another example is the system of shapes. Continual variation is possible from the geometrically perfect circle to the geometrically perfect square, and from each of these and all the intermediates to a variety of other shapes. There is thus a multidimensional shape-space. The English language cuts a great portion of this into blocks to which are attached terms. These terms contrast in a set of ordered interrelationships, much like what was observed in the case of colors. This system differs from the color system in a number of respects, but most importantly in that it does not exhaustively cover its domain. There are vast number of shapes for which no simple term is available. This is very probably associated with the very much greater complexity of the shape-space than of the color-space. We do not in English have a very well-ordered hierarchy of more and less inclusive shape terms, but other languages do. In German for some speakers, Viereck includes Rechteck, and this in turn Quadrat.

13. The cntent system in lexical definition I would like to suggest that the task of giving adequate definitions to such words as red, vermilion, and cyanic would be greatly facilitated and the definitions greatly improved by defining in relation to the total system of color terms. But only as a temporary expedient is it feasible to do this within the framework of a dictionary. It is obviously inefficient to describe the whole structure at each article. Yet the whole structure is in some way pertinent. It would be possible, and it might be very advantageous, to state the most relevant parts of the system in an individual dictionary article. (Much as the two very special relationships synonymy and antinymy have long been singled out)

But the ultimate solution does not rest here any more than the ultimate solution for grammatical description rests in giving the relevant grammatical information at each dictionary entry, and for the same reasons. Grammar and content are both networks of interrelationships, and they cannot be done justice to proceeding from invidivual nodes in the networks. Just as we find it desirable to have a systematic grammatical statement to which the dictionary refers, so we would find it useful to have a systematic content description to which the dictionary might refer. Structure is always best presented systematically. Or if a structure is presented in fragments for reasons of convenience, it is essential that this be done against the background of a systematic statement, preferably one which is available to the user of the dictionary. A complete language description would require a grammatical statement, a content description, and a dictionary.

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14. The function of the dictionary again If the proper description of a language contains not only a grammatical statement but also a content description, what is the function of a dictionary? I suggest that it is basically that which was listed above as number 5, to correlate the several structural systems, in combination with that listed as number 6, to define referential meaning. In a sense these are quite similar. Referential meaning is presumably a vast asso tment of structures, mostly outside and indeed far removed from linguistics. The dictionary is then the meeting place of all the systems, linguistic and non-linguistic which bear relevantly on speech behavior. If is this nature of the dictionary that demands that it be arranged in some non-systematic way. (In the sense that, say, alphabetic order has no real linguistic significance.) It can only be a series of loosely articulated articles each bringing together elements from several disparate structural systems. This is true whether those structure systems are structurally understood or not. From the linguists point of view it is essential that for every morpheme or word (or whatever sort of items are to be included) the dictionary give its relations to the grammar in terms of the classes and sub-classes to which it is related, its relations to the content structure in terms of the classes, hierarchies, and collocational restrictions to which it is related, and of course its phonemic and/or morphophonemic shape.

A dictionary ought also to relate the vocabulary of the language to certain extra-linguistic systems. The referential meaning is the most obvious. Along with this however, is required some relation to the culture in the form of statements about the cultural implications of items, their appropriateness in various culturally definable situations, and the like.

15. A few suggestions for lexicographical practice What I have said above is of little immediate relevance for dictionary making, though it does suggest certain lines for basic research which may ultimately be of significance to lexicography. However, there are a few suggestions which arise out of these remarks that may be of some more immediate significance.

1. Dictionaries and grammatical statements can profitably be designed as parts of a unified program of language description. The objective of such a program should be the adequate description of all language phenomena with in its terms of reference. This can be most efficiently fulfilled when the several descriptive instruements are closely keyed to each other.

2. The dictionary should give for each item all pertinent grammatical identification. It is inadequate, particularly in a bilingual dictionary, merely to label items as noun or verb if it is known that there are significant subclasses within such classes. The dictionary should indeed index the grammatical statement.

3. Conversely, the grammatical statement should be organized in such a way as to facilitate the use of the dictionary and give adequate definition of the grammatical identifications which are there given.

4. The dictionary should give particular attention to class-cleavage, as this is an important factor in understanding the grammatical structure of a language which can seldom be adequately treated in a grammatical statement.

5. Pending the day when we may have content analyses which are systematic and reasonably complete, we ought to make maximum use of the available scraps of information about ordered contrast, hierarchical substitution relations, and patterned collocations. In particular, the latter notion should give some guidance in the selection of illustrative citations.